

HRS DOCUMENTATION RECORD--REVIEW COVER SHEET

Name of Site: Peninsula Boulevard Ground Water Plume

Date Prepared: February 2004

Contact Persons

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Pathways, Components, or Threats Not Scored

The Potential-to-Release and Targets-Potential Contamination components of the Ground Water Pathway are not scored because the listing decision is not significantly affected by those components. The Surface Water, Soil Exposure Pathways, and Air Pathways are not scored because the listing decision is also not significantly affected by those pathways.

Motts Creek, a stream near the plume, is adversely affected as the information in the HRS documentation record indicates. The investigation by NYSDEC indicated that PCE is present in a stream located in the immediate vicinity of the contaminated ground water plume. The stream flows north from the main plume area and across the grounds of Woodmere Junior High School North, about 100 feet from the building. NYSDEC reported that access to the contaminated surface water is restricted but not secure, and observed an access way to the stream on school property. Although there is evidence of a release to surface water and the possibility of subsequent human contact with contaminated media, there is insufficient data to evaluate this threat.

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HRS DOCUMENTATION RECORD

Name of Site: Peninsula Boulevard Ground Water Plume Date Prepared: February 2004
CERCLIS ID: NYN000204407
EPA Region: 2
Street Address of Site: Peninsula Boulevard and Hamilton Avenue, Hewlett, NY 11557
County and State: Nassau County, New York
General Location in the State: southwestern Long Island
Topographic Map: Lynbrook, NY
Latitude: 40° 38' 34.1" North Longitude: 073° 42' 23.1" West

Note: The reference point for the street address and site latitude/longitude is the centroid of the ground water plume.
[Ref. 3, p. 1; 4, p. 103; 5, p. 1; 6, pp. 1, 2]

Scores

Ground Water Pathway	100.00
Surface Water Pathway	Not Scored
Soil Exposure Pathway	Not Scored
Air Pathway	Not Scored

HRS SITE SCORE 50.00

WORKSHEET FOR COMPUTING HRS SITE SCORE
Peninsula Boulevard Ground Water Plume

	<u>S</u>	<u>S²</u>
1. Ground Water Migration Pathway Score (S _{gw}) (from Table 3-1, line 13)	<u>100.00</u>	<u>10,000.00</u>
2a. Surface Water Overland/Flood Migration Component (from Table 4-1, line 30)	<u>Not Scored</u>	
2b. Ground Water to Surface Water Migration Component (from Table 4-25, line 28)	<u>Not Scored</u>	
2c. Surface Water Migration Pathway Score (S _{sw}) Enter the larger of lines 2a and 2b as the pathway score.	<u>Not Scored</u>	
3. Soil Exposure Pathway Score (S _s) (from Table 5-1, line 22)	<u>Not Scored</u>	
4. Air Migration Pathway Score (S _a) (from Table 6-1, line 12)	<u>Not Scored</u>	
5. Total of S _{gw} ² + S _{sw} ² + S _s ² + S _a ²	<u>10,000.00</u>	
6. HRS Site Score Divide the value on line 5 by 4 and take the square root	<u>50.00</u>	

GROUND WATER MIGRATION PATHWAY SCORESHEET
Peninsula Boulevard Ground Water Plume

GROUND WATER MIGRATION PATHWAY Factor Categories & Factors	MAXIMUM VALUE	VALUE ASSIGNED
Likelihood of Release to an Aquifer Aquifer: Upper Glacial/Jameco		
1. Observed Release	550	550
2. Potential to Release		
2a. Containment	10	NS
2b. Net Precipitation	10	NS
2c. Depth to Aquifer	5	NS
2d. Travel Time	35	NS
2e. Potential to Release [lines 2a (2b+2c+2d)]	500	NS
3. Likelihood of Release	550	550
Waste Characteristics		
4. Toxicity/Mobility	*	100
5. Hazardous Waste Quantity	*	100
6. Waste Characteristics	100	10
Targets		
7. Nearest Well	50	50
8. Population		
8a. Level I Concentrations	**	63,970
8b. Level II Concentrations	**	0
8c. Potential Contamination	**	NS
8d. Population (lines 8a+8b+8c)	**	63,970
9. Resources	5	NS
10. Wellhead Protection Area	20	20
11. Targets (lines 7+8d+9+10)	**	64,040
12. Targets (including overlaying aquifers)	**	64,040
13. Aquifer Score (lines 3x6x12 divided by 82,500)	100	100
GROUND WATER MIGRATION PATHWAY SCORE (Sgw)	100	100

NS Not scored
* Maximum value applies to waste characteristics category.
** Maximum value not applicable

REFERENCES

Reference Number	<u>Description of the Reference</u>
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2.	EPA. <u>Superfund Chemical Data Matrix, SCDM Data Version: 1/27/2004, Appendices B-I, B-II, and C</u> . January 2004. [54 pages]
3.	EPA. <u>Superfund Information Systems, CERCLIS Database, Peninsula Boulevard Groundwater Plume: Site Information and Actions</u> . From http://www.epa.gov/superfund . December 16, 2003. [2 pages]
4.	TAMS Consultants, Inc. and GZA GeoEnvironmental of New York. <u>Final Remedial Investigation, Grove Cleaners, Site No. 1-30-059</u> . Prepared for New York State Department of Environmental Conservation (NYSDEC). February 2002. [321 pages]
5.	U.S. Department of the Interior Geological Survey (USGS). <u>Lynbrook Quadrangle, New York, 7.5-Minute Series (Topographic)</u> . 1969. [1 page]
6.	Gilliland, Gerry, Weston Solutions, Inc. (WESTON). <u>Latitude and Longitude Calculation Worksheet, Peninsula Boulevard Groundwater Plume</u> . November 24, 2003. [2 pages]
7.	Weitzman, Bob, Nassau County Department of Health (NCDH). <u>FAX Transmittal to Nancy Garry, NYSDEC, Re: Listed Dry Cleaners with NCDH in the area of Grove Cleaners/Site # 1-30-059</u> . June 18, 2001. [10 pages]
8.	Environmental Data Resources, Inc. (EDR). <u>The EDR-Radius Map with GeoCheck®, Peninsula Blvd Groundwater Contamination, Peninsula Blvd/Hamilton Ave, Hewlett, NY 11557, Inquiry Number: 1924519.5p</u> . February 10, 2003. [75 pages]
9.	EPA. <u>Online Database Searches for ZIP Code 11557 (Hewlett, NY) and Woodmere, NY: Envirofacts Warehouse, Resource Conservation and Recovery Act (RCRAInfo), Query Results: Enforcement and Compliance History Online (ECHO), Search Results (All Programs)</u> . Accessed and printed January 9, 2004. [69 pages]
10.	Gilliland, Gerry, WESTON. <u>Project Note, with attachments, to Peninsula Boulevard GW Plume site file, Subject: Meeting at Nassau County Department of Health (NCDH)</u> . November 18, 2003. [14 pages]
11.	Gilliland, Gerry, WESTON. <u>Telecon Notes, Conversations with Bill Varley, Long Island Water Corp., Re: Request for Information about Plant 5 Well Field</u> . November 4, 2003 and January 7, 2004. [2 pages]
12.	EPA - Envirofacts Warehouse - SDWIS. <u>Safe Drinking Water Information System (SDWIS), Query Results and Violation Report, Long Island Water Corp, Nassau County, NY</u> . Accessed and printed December 11, 2003. [4 pages]
13.	Gilliland, Gerry, WESTON. <u>Project Note, with attachments, to Peninsula Blvd GW Plume file, Subject: Aquifer of Concern, Population Served, and Nearest Well</u> . January 16, 2004. [67 pages]

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15.	Nofi, Michael, Long Island American Water (LIWC). <u>Letter, with enclosed quarterly VOC data, to Gerry Gilliland, WESTON, Re: Peninsula Boulevard Groundwater Contamination Site (In relation to Plant #5/Wellfield 5-R)</u> . January 8, 2004. [66 pages]
16.	Cartwright, Richard A., USGS. <u>History and Hydrologic Effects of Ground-Water Use in Kings, Queens, and Western Nassau Counties, Long Island, New York, 1800's through 1997</u> . <i>Water-Resources Investigation Report 01-4096</i> . Coram, NY. 2002. [79 pages]
17.	Gilliland, Gerry, WESTON. <u>Telecon Note with attachments, Conversations with Richard Cartwright, USGS, Re: Request for Information about USGS Wells</u> . January 15, 2004. [19 pages]
18.	Soren, Julian and Dale L. Simmons, USGS. <u>Thickness and Hydrogeology of Aquifers and Confining Units Below the Upper Glacial Aquifer on Long Island, New York</u> . <i>Water-Resources Investigation Report 86-4175</i> . 1987. [3 sheets]
19.	Busciolano, Ronald, USGS. <u>Water-Table and Potentiometric-Surface Altitudes of the Upper Glacial, Magothy, and Lloyd Aquifers on Long Island, New York, in march-April 2000, with a Summary of Hydrogeologic Conditions</u> . <i>Water-Resources Investigation Report 01-4165</i> . 2002. [17 pages]
20.	Chu, Anthony, Jack Monti Jr., and Anthony J. Bellitto Jr., USGS. <u>Public-supply Pumpage in Kings, Queens, and Nassau Counties, New York, 1880-1995</u> . <i>Open-File Report 97-567</i> . 1997. [61 pages]
21.	CompuChem Environmental (CompuChem). <u>Transmittal to Allen Burton, TAMS, Subject: Report of Data - Project: GROVE CLEANERS Quote #: Q1175 SDG #: S1175</u> . March 21, 2000. [672 pages]
22.	CompuChem. <u>Transmittal to Allen Burton, TAMS, Subject: Report of Data - Project: GROVE CLEANERS Quote #: Q1175 SDG #: T1175</u> . March 23, 2000. [683 pages]
23.	CompuChem. <u>Transmittal to Allen Burton, TAMS, Subject: Report of Data - Project: GROVE CLEANERS Quote #: Q1175 SDG #: V1175</u> . March 30, 2000. [831 pages]
24.	CompuChem. <u>Transmittal to Allen Burton, TAMS, Subject: Report of Data - Project: GROVE CLEANERS Quote #: Q1175 SDG #: B1175</u> . March 31, 2001. [561 pages]
25.	CompuChem. <u>Transmittal to Allen Burton, TAMS, Subject: Report of Data - Project: GROVE CLEANERS Quote #: Q1175 SDG #: C1175</u> . April 4, 2001. [488 pages]
26.	CompuChem. <u>Transmittal to Allen Burton, TAMS, Subject: Report of Data - Project: GROVE CLEANERS Quote #: Q1175 SDG #: E1175</u> . October 31, 2001. [432 pages]
27.	CompuChem. <u>Transmittal to Allen Burton, TAMS, Subject: Report of Data - Project: GROVE CLEANERS Quote #: Q1175 SDG #: G1175</u> . November 8, 2001. [432 pages]

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30.	Snyder, Scott, WESTON. <u>Project Note, with attachments, to Peninsula Boulevard File, Subject: Calculation of Sample Quantitation Limits</u> . February 16, 2004. [112 pages]
31.	Gilliland, Gerald, WESTON. <u>Project Note, with attachments, to Peninsula Boulevard GW Contamination site file, Subject: 401 Mill Road, Peninsula Blvd. area</u> . November 25, 2003. [17 pages]
32.	Meyer, George C., EPA. <u>Letter to Angelo Park, Re: Notice of Violation, RCRA § 3007 Information Request, Mill Road Drive-In Cleaner - EPA ID No.: NYD987020849</u> . January 16, 2004. [11 pages]
33.	Gilliland, Gerald, WESTON. <u>Project Note, with attachments, to Peninsula Boulevard GW Contamination site file, Subject: 1244 W. Broadway, Peninsula Blvd. area</u> . December 1, 2003. [28 pages]
34.	Parish, Walter, NYSDEC. <u>Fax Transmission to Ildefonso Acosta, EPA, Re: FYI - Cedarwood Cleaners Hewlett - Part 232 Inspection Report</u> . February 27, 2003. [12 pages]
35.	Meyer, George C., EPA. <u>Letter to David Rosenblatt, Re: Notice of Violation, RCRA § 3007 Information Request, Cedar Wood Cleaners - EPA I.D. No.: NYD 981 876 022, a.k.a. Cedarwood Cleaners - EPA I.D. No.: NYD 049 251 56421</u> . Date unknown. [12 pages]
36.	Gilliland, Gerald, WESTON. <u>Project Note, with attachments, to Peninsula Boulevard GW Contamination site file, Subject: 1245 Broadway, Peninsula Blvd. area</u> . November 25, 2003. [36 pages]
37.	Gilliland, Gerald, WESTON. <u>Project Note, with attachments, to Peninsula Boulevard GW Contamination site file, Subject: 1345 Peninsula Boulevard, Peninsula Blvd. area</u> . December 8, 2003. [57 pages]
38.	Gilliland, Gerald, WESTON. <u>Project Note, with attachments, to Peninsula Boulevard GW Contamination site file, Subject: 1344 Broadway, Peninsula Blvd. area</u> . November 25, 2003. [10 pages]
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40.	Gilliland, Gerald, WESTON. <u>Project Note, with attachments, to Peninsula Boulevard GW Contamination site file, Subject: 1309 Broadway, Peninsula Blvd. area</u> . December 1, 2003. [48 pages]
41.	Gilliland, Gerald, WESTON. <u>Project Note, with attachments, to Peninsula Boulevard GW Contamination site file, Subject: 1435 Broadway, Peninsula Blvd. area</u> . November 25, 2003. [47 pages]
42.	Gilliland, Gerald, WESTON. <u>Project Note, with attachments, to Peninsula Boulevard GW Contamination site file, Subject: 1510 Broadway, Peninsula Blvd. area</u> . November 25, 2003. [23 pages]

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44.	Gilliland, Gerry, WESTON. <u>Telecon Note, Conversation with Michael Nofi, Long Island Water Corp., Re: Plant 5 Well Field Sampling Procedures and Analytical Data.</u> February 23, 2004. [1 page]
45.	Nofi, Michael, LIWC. <u>Letter, with enclosed quarterly VOC data, to Gerry Gilliland, WESTON, Re: Peninsula Boulevard Groundwater Contamination Site (Grove Cleaners) (In relation to Plant #5/ Wellfield 5-R).</u> February 25, 2004. [30 pages]

INTRODUCTION

The Peninsula Boulevard Ground Water Plume site (CERCLIS No. NYN000204407) is the location of a ground water plume with no identified source(s) of contamination. The plume was discovered when New York State Department of Environmental Conservation (NYSDEC) conducted a Remedial Investigation (RI) of a dry-cleaning business in Hewlett, Nassau County, New York [Ref. 3, p. 1; 4, pp. 48, 49, 103]. The investigation results indicated that almost 6,000 parts per billion (ppb) of tetrachloroethylene (PCE) are present in the shallow ground water beneath a predominantly residential area; however, the highest concentrations and majority of plume area are not located directly beneath the subject dry-cleaning facility. Therefore, NYSDEC concluded that there is not enough evidence to identify the subject facility as the source of contamination [Ref. 4, pp. 11, 26, 31, 37, 38, 49, 103]. There are numerous other current and former dry-cleaning facilities in Hewlett and the surrounding towns [Ref. 4, pp. 116, 117; 7, pp. 1 through 10; 8, pp. 5, 8; 9, pp. 1 through 17, 49 through 56; 10, pp. 2 through 13].

The NYSDEC RI indicated that ground water flows from the main plume area to the northwest, in the direction of the Long Island Water Corporation (LIWC) Plant 5 Well Field [Ref. 4, pp. 22, 28, 47, 93, 100]. This cluster of 43 active wells (and numerous inactive wells) is located just northwest of the plume delineated by the RI [Ref. 4, pp. 93, 103; 10, p. 1; 11, p. 2]. The active wells are all screened in the Jameco aquifer at depths of approximately 150 feet, and contribute to the LIWC system through a common suction unit that prevents access to individual wells [Ref. 10, p. 1; 11, pp. 1, 2]. LIWC considers the entire well field to be a single component of its blended system, which has 36 components (i.e., ground water wells or well fields) and serves a total population of 230,300 people [Ref. 11, p. 2; 12, p. 3]. No single system component provides more than 40% of the LIWC water supply, so the Plant 5 Well Field supplies water to approximately 6,400 people [Ref. 11, p. 2; 13, p. 1].

The people served by the LIWC Plant 5 Well Field are subject to contamination above health-based criteria prior to treatment, and the contaminants are attributable to the Peninsula Boulevard Ground Water Plume site [Ref. 13, p. 1]. Since April 1991, the Plant 5 well water has been treated by a packed tower aeration system (i.e., air strippers) with design capacity for 33 ppb of PCE [Ref. 10, pp. 1, 14; 14, p. 30]. PCE was detected in every quarterly raw water sample collected at the Plant 5 Well Field from 1991 through 1993 and from 1999 through 2003, at concentrations ranging from 4.3 to 34 micrograms per liter (ug/L) [Ref. 14, p. 30; 15, pp. 2 through 64; 45, pp. 7 through 29]. Trichloroethylene (TCE) was detected in 14 of 20 samples and cis-1,2-dichloroethylene (cis-1,2-DCE) was detected in four samples, at individual concentrations ranging from 0.5 ug/L to 3.1 ug/L [Ref. 15, pp. 2 through 64]. The contaminants detected at the LIWC Plant 5 Well Field are at the leading edge of the contaminated ground water plume [Ref. 4, p. 103]. Non-detect background levels, for nearby observation wells screened at similar depths in the Jameco aquifer as the active Plant 5 wells, are shown by USGS samples collected in 1992 [Ref. 16, pp. 12, 34; 17, pp. 7, 9, 11, 15, 17, 19]. No other target wells are known to contain contamination attributable to the site, making the Upper Glacial/Jameco the aquifer of concern [Ref. 13, p. 1].

The Peninsula Boulevard Ground Water Plume site is underlain by the upper glacial (water-table) aquifer, Gardiners Clay, Jameco aquifer, Magothy aquifer, Raritan clay, Lloyd aquifer, and bedrock, in descending order [Ref. 18, pp. 1, 2, 3; 19, pp. 3 through 8]. The upper glacial (water-table) aquifer is no longer used for water supply in the site vicinity [Ref. 10, p. 1; 11, p. 2]. Well logs and geologic literature show that the Gardiners Clay is not a continuous confining layer throughout the 2-mile radius of the site, including at the Plant 5 Well Field. The clay can be sandy, present only in lenses less than 3 feet thick, or absent [Ref. 11, p. 2; 13, pp. 1, 12, 44, 45, 64; 18, p. 3]. The upper glacial aquifer directly overlies the Jameco aquifer north of the site, and the two units are both moderately to highly permeable with nearly identical hydraulic conductivities [Ref. 19, pp. 3, 4, 5]. Based on these considerations, the upper glacial (water-table) and Jameco aquifers are hydraulically connected in the immediate vicinity of the ground water plume [Ref. 13, p. 1]. The Jameco aquifer is also hydraulically connected to the underlying Magothy, which is the primary aquifer in Nassau County [Ref. 18, p. 1; 20, p. 61]. The Lloyd aquifer is separated from the Magothy by the intervening Raritan clay, which is thick and laterally extensive [Ref. 18, pp. 1, 2, 3]. The bedrock surface underlying the Lloyd aquifer forms the base of Long Island's ground-water reservoir [Ref. 19, p. 6].

INTRODUCTION (continued)

The results of the NYSDEC investigation also indicated that PCE is present in a stream located in the immediate vicinity of the contaminated ground water plume [Ref. 4, pp. 33, 34, 95]. The stream flows north from the main plume area and across the grounds of Woodmere Junior High School North, about 125 to 150 feet from the building [Ref. 4, pp. 24, 98, 103]. NYSDEC reported that access to the contaminated surface water is restricted but not secure, and observed an access way to the stream on school property [Ref. 4, p. 41].

SOURCE DESCRIPTION

2.2 SOURCE CHARACTERIZATION

Number of the source: 1

Source Type of the source: Other (ground water plume)

Name and description of the source: Peninsula Boulevard Ground Water Plume with no identified source

Source 1 is a contaminated ground water plume with no identified source of contamination. Currently, the plume is documented by the presence of PCE at concentrations up to 5,900 ug/L in the vicinity of Peninsula Boulevard and the LIWC Plant 5 Well Field. The plume was discovered when NYSDEC conducted an RI of a dry-cleaning business on Peninsula Boulevard in Hewlett, New York [Ref. 3, p. 1; 4, pp. 48, 49, 103]. The investigation results indicated that PCE is present in the shallow ground water beneath a predominantly residential area; however, the highest concentrations and majority of plume area are not located directly beneath the subject dry-cleaning facility. Therefore, NYSDEC concluded that there is not enough evidence to identify the subject facility as the source of contamination [Ref. 4, pp. 11, 26, 31, 37, 38, 49, 103]. There are numerous other current and former dry-cleaning facilities in Hewlett [Ref. 4, pp. 116, 117; 7, pp. 1 through 10; 8, pp. 5, 8; 9, pp. 1 through 17; 10, pp. 2 through 9]. The source is evaluated as a contaminated ground water plume with no identified source because there is not adequate information to attribute the contamination directly to any of these possible waste sources, which are discussed in Section 3.1.1 (Observed Release) of the Ground Water Pathway.

The NYSDEC RI indicated that ground water flows from the main plume area to the northwest, in the direction of the LIWC Plant 5 Well Field [Ref. 4, pp. 22, 28, 47, 93, 100]. Since April 1991, the Plant 5 well water has been treated by a packed tower aeration system (i.e., air strippers) with design capacity for 33 ppb of PCE [Ref. 10, pp. 1, 14; 14, p. 30]. PCE was detected in every quarterly raw water sample collected at the Plant 5 Well Field from 1999 through 2003, at concentrations ranging from 4.3 ug/L to 14.4 ug/L [Ref. 14, p. 30; 15, pp. 2 through 64]. TCE was detected in 14 of 20 samples and cis-1,2-DCE was detected in four samples, at individual concentrations ranging from 0.5 ug/L to 3.1 ug/L [Ref. 15, pp. 2 through 64]. Non-detect background levels, for nearby observation wells screened at similar depths in the Jameco aquifer as the active Plant 5 wells, are shown by USGS samples collected in 1992 [Ref. 16, pp. 12, 34; 17, pp. 7, 9, 11, 15, 17, 19]. The contaminants detected at the LIWC Plant 5 Well Field are associated with the Peninsula Boulevard Ground Water Plume site and are suspected to be the leading edge of the plume [Ref. 4, p. 103; 13, p. 1]. Based on these considerations, the Plant 5 Well Field is considered to be part of Source 1, the contaminated ground water plume.

Location of the source, with reference to a map of the site:

The extent of the ground water contamination defines the site. The location of the plume is shown in Figure 1.

Containment

Release to ground water:

Based on evidence of hazardous substance migration from an unknown source area (contamination detected in ground water samples collected from several GeoProbe™ boreholes and a nearby public supply well field), a containment factor of 10 is assigned [Ref. 1, p. 51596].

2.4.1 Hazardous Substances

Two sets of analytical data show the extent of Source 1, the contaminated ground water plume: RI GeoProbe™ samples and LIWC Plant 5 Well Field raw water samples. This evaluation of the source only considers detections that are significantly above background. The two sets of analytical data are evaluated independently for significance above background because they were collected from different strata and different depth ranges. The RI GeoProbe™ samples were collected from the upper glacial aquifer at depths ranging from 4 to 41 feet below ground surface [Ref. 4, pp. 66 through 72], while the Plant 5 samples and associated background samples were collected from wells screened in the Jameco aquifer at depths ranging from 130 to 172 feet below ground surface [Ref. 11, pp. 1, 2; 17, pp. 6, 9, 11]. The contaminated samples are all considered to be part of the same plume because the upper glacial and Jameco aquifers are hydraulically connected at the Plant 5 Well Field (i.e., at the site) [Ref. 13, p. 1].

The RI GeoProbe™ ground water samples were collected on behalf of the NYSDEC Superfund Standby Program in accordance with standard field activity procedures, including equipment decontamination between samples [Ref. 4, pp. 9, 16 through 21, 165 through 174]. A NYSDOH-certified laboratory analyzed the samples for Target Compound List (TCL) volatile organic compounds (VOC), and an independent contractor performed data validation of the results [Ref. 4, pp. 18, 239 through 249]. The validator found the data for all samples collected during the RI to be fully usable for quantitative uses [Ref. 4, pp. 243, 247, 249]. PCE, TCE, and cis-1,2-DCE were detected at significant concentrations in several RI GeoProbe™ ground water samples, while other samples showed non-detect background concentrations for all three contaminants beyond the horizontal and vertical extent of the plume [Ref. 4, pp. 66 through 72, 103]. Numerous other VOCs were detected in RI ground water samples but are not considered in evaluation of the source. Methyl-tertiary-butyl ether (MTBE), benzene, toluene, ethylbenzene, and xylenes are gasoline-related compounds that are not considered to be part of the site because of the petroleum exclusion. Numerous other compounds were detected only at estimated concentrations below the Sample Quantitation Limits (SQL) or at insignificant concentrations below the maximum background SQLs; several chlorinated solvents that might be associated with the plume, including vinyl chloride and 1,1-dichloroethene, fit into that category [Ref. 4, pp. 66 through 72].

Analytical data obtained from the water company (i.e., LIWC) document PCE and TCE contamination at the Plant 5 Well Field for the period from 1999 to 2003 [Ref. 15, all pages]. The well field has been contaminated with PCE since 1991, when LIWC installed air strippers to treat the well water [Ref. 10, p. 1, 14; 14, p. 30]. Nearby USGS observation wells screened at similar depths in the Jameco aquifer show non-detect background concentrations for samples collected in October/November 1992. The background SQL for each compound (PCE and TCE) in the USGS samples was 3 ug/L [Ref. 17, pp. 6, 9, 11, 15, 17, 19].

The data listed in the table below for evaluation of Source 1 include VOC detections that meet the following criteria:

- C Greater than or equal to the sample SQL [Ref. 30, pp. 7 through 14];
- C Greater than or equal to the appropriate maximum background SQL (10 ug/L for GeoProbe™ samples [Ref. 30, pp. 1 through 6] and 3 ug/L for Plant 5 samples [Ref. 17, pp. 6, 9, 11, 15, 17, 19], for all three contaminants), because the compounds were not detected above SQLs in any background samples; and
- C Not flagged with “J” as an estimated value.

The following qualifiers and abbreviations are used in the table below [Ref. 21, pp. 135, 136; 22, pp. 149, 150; 23, pp. 119, 120; 24, pp. 105, 106; 25, pp. 90, 91; 26, pp. 99, 100; 27, pp. 106, 107]:

- ug/L Micrograms per liter
- U The compound was not detected at or above the SQL in any background samples.
- D The reported value is from a dilution of the sample.
- * The Plant 5 Well Field has been contaminated with PCE since April 1991, when a treatment system was installed. PCE concentrations have not increased or decreased significantly since then. The values listed below are for recent samples, which provide evidence for current conditions within the source and are used to document an ongoing observed release to ground water (Section 3.1.1).

Bold Underline indicates the maximum concentration of each compound.

Hazardous Substance	Sample ID	Depth (ft)	Sample Date	Conc. (ug/L)	SQL (ug/L)	Max. Bkgd. (ug/L)	Bkgd. SQL (ug/L)	Reference
cis-1,2-DCE	GP-7W13-17	13	3/8/2000	21	0.5	10 U	10	22, pp. 38,
	GP-7W21-24	21	3/8/2000	22	0.5			44;
	GP-16 6-10	6	3/12/2001	<u>57</u>	10			24, pp. 18,
	GP-25 16-20	16	3/15/2001	47	10			40;
	GP-29 11-15	11	3/16/2001	12	10			25, pp. 16,
	GP-30 11-15	11	3/16/2001	16	10			20;
	GP-42 11-15	11	10/22/2001	48	10			27, pp. 18,
	GP-43 21-25	21	10/22/2001	28	10			22
PCE	GP-2W8-12	8	3/2/2000	330 D	12.5	10 U	10	21, pp. 34,
	GP-2W16-20	16	3/2/2000	5,600 D	125			36, 40, 42,
	GP-4W11-15	11	3/6/2000	16 D	1.2			50, 52;
	GP-7W13-17	13	3/8/2000	1,000 D	25			22, pp. 38,
	GP-7W17-21	17	3/8/2000	3,900	125			40, 42, 44,
	GP-7W21-24	21	3/8/2000	660 D	25			46;
	GP-10W16-20	16	3/10/2000	95 D	5			23, pp. 17,
	GP-10W20-24	20	3/10/2000	150 D	5			19, 21, 23,
	GP-13W6-10	6	3/14/2000	19 D	2			35, 37, 39,
	GP-13W18-22	18	3/14/2000	3,200 D	83.4			41, 45, 47;
	GP-14W4-8	4	3/15/2000	36 D	1.6			
	GP-16 6-10	6	3/12/2001	310 D	50			24, pp. 18,
	GP-17 16-20	16	3/13/2001	51	10			20, 22, 24,
	GP-18 21-25	21	3/13/2001	110	10			26, 28, 34,
	GP-19 11-15	11	3/14/2001	120	10			36, 38;
	GP-20 16-20	16	3/14/2001	23	10			
	GP-23 6-10	6	3/15/2001	160 D	20			
	GP-24 11-15	11	3/15/2001	550	100			
	GP-29 11-15	11	3/16/2001	2,400 D	250			25, pp. 16,
	GP-30 11-15	11	3/16/2001	1,500 D	100			18, 20, 22,
	GP-34 16-20	16	3/19/2001	4,500 D	500			30, 32;
	GP-38 11-15	11	10/17/2001	<u>5,900</u>	333			26, pp. 22,
	GP-39 11-15	11	10/18/2001	5,400	1,000			24, 26;
	GP-40 21-25	21	10/18/2001	16	10			
	GP-42 11-15	11	10/22/2001	670 D	71			27, pp. 21,
	GP-43 21-25	21	10/22/2001	25	10			23, 31;
	GP-50 11-15	11	10/23/2001	620 D	62			
	Plant 5	150	1999 to 2003*	4.3 to 14.4	0.5	3 U	3	15, pp. 2 through 64
TCE	GP-7W13-17	13	3/8/2000	44 D	25	10 U	10	22, pp. 38,
	GP-7W21-24	21	3/8/2000	<u>240 D</u>	25			40, 44, 46;
	GP-10W20-24	20	3/10/2000	29 D	5			23, pp. 21,
	GP-13W18-22	18	3/14/2000	140 D	83.4			23, 35, 37,
	GP-14W16-20	16	3/15/2000	19	0.5			43;
	GP-29 11-15	11	3/16/2001	140	10			25, pp. 16,
	GP-30 11-15	11	3/16/2001	100	10			20;
	GP-42 11-15	11	10/22/2001	40	10			27, p. 19;
	Plant 5	150	11/10/1999	3.1	0.5	3 U	3	15, p. 10

2.4.2 Hazardous Waste Quantity

2.4.2.1.1 Hazardous Constituent Quantity

The information available is not sufficient to evaluate Tier A source hazardous waste quantity; therefore, hazardous constituent quantity is not scored (NS).

Hazardous Constituent Quantity (C) Value: NS

2.4.2.1.2 Hazardous Wastestream Quantity

The information available is not sufficient to evaluate Tier B source hazardous waste quantity; therefore, hazardous wastestream quantity is not scored.

Hazardous Wastestream Quantity (W) Value: NS

2.4.2.1.3 Volume

Based on analytical results of ground water samples collected from 1999 through 2003, it is apparent that some amount of contamination is present. Because there are numerous samples showing contamination in the ground water but the volume of the contaminated area has not been determined, the volume of the source is considered to be greater than 0 cubic yards but unknown. Therefore, volume (V) is assigned a value of >0 [Ref. 1, p. 51591]. The Hazardous Waste Quantity (HWQ) value was determined as follows, as stated in Table 2-5 of the HRS:

$$\begin{aligned}\text{Volume of the plume (yd}^3\text{)} / 2.5 &= \text{HWQ} \\ \text{HWQ} &= >0 / 2.5 = >0\end{aligned}$$

Dimension of source (yd³): >0

Volume (V) Assigned Value: >0

2.4.2.1.4 Area

Since the volume of the waste source can be determined, a value of 0 is given for area measurement [Ref. 1, p. 51591].

Area of source (ft²): N/A

Area (A) Assigned Value: 0

2.4.2.1.5 Source Hazardous Waste Quantity Value

The source hazardous waste quantity value for Source 1 is >0 for Tier C - Volume [Ref. 1, p. 51591].

Source Hazardous Waste Quantity Value: >0

SITE SUMMARY OF SOURCE DESCRIPTIONS

<u>Source Number</u>	<u>Source Hazardous Waste Quantity Value</u>	<u>Containment</u>			
		<u>Ground Water</u>	<u>Surface Water</u>	<u>Gas</u>	<u>Air Particulate</u>
1	>0	10	NS	NS	NS

NS = Not Scored

3.0 GROUND WATER MIGRATION PATHWAY

3.0.1 General Considerations

The Peninsula Boulevard Ground Water Plume site is underlain by the upper glacial (water-table) aquifer, Gardiners Clay, Jameco aquifer, Magothy aquifer, Raritan clay, Lloyd aquifer, and bedrock, in descending order [Ref. 18, pp. 1, 2, 3; 19, pp. 3 through 8]. The upper glacial (water-table) aquifer is no longer used for water supply in the site vicinity, but it is contaminated [Ref. 10, p. 1; 11, p. 2]. The Gardiners Clay is not a continuous confining layer throughout the 2-mile radius of the site, including at the LIWC Plant 5 Well Field (i.e., the northwestern end of the plume) [Ref. 11, p. 2; 13, pp. 1, 12, 44, 45, 64; 18, p. 3]. The upper glacial aquifer directly overlies the Jameco aquifer north of the site, and the two units are both moderately to highly permeable with nearly identical hydraulic conductivities [Ref. 19, pp. 3, 4, 5]. Based on these considerations, the upper glacial (water-table) and Jameco aquifers are hydraulically connected at the Plant 5 Well Field (i.e., at the site) [Ref. 13, p. 1]. The Jameco aquifer is also hydraulically connected to the underlying Magothy aquifer, which is the primary source of public drinking water in Nassau County [Ref. 18, p. 1; 20, p. 61]. The Lloyd aquifer is separated from the Magothy by the intervening Raritan clay, which is thick and laterally extensive [Ref. 18, pp. 1, 2, 3]. The bedrock surface underlying the Lloyd aquifer forms the base of Long Island's ground-water reservoir [Ref. 19, p. 6].

NYSDEC discovered the ground water plume during the investigation of a dry-cleaning business [Ref. 3, p. 1; 4, pp. 48, 49, 103]. The NYSDEC RI results indicated that almost 6,000 ppb of PCE are present in ground water to depths of 41 feet below ground surface [Ref. 4, pp. 11, 26, 31, 37, 38, 49, 66 through 72, 103], and that ground water flows from the main plume area to the northwest in the direction of the Plant 5 Well Field [Ref. 4, pp. 22, 28, 47, 93, 100]. This cluster of 43 active wells (and numerous inactive wells) is located just northwest of the plume delineated by the RI [Ref. 4, pp. 93, 103; 10, p. 1; 11, p. 2]. The active wells are all screened in the Jameco aquifer at depths of approximately 150 feet, and contribute to the LIWC system through a common suction unit that prevents access to individual wells [Ref. 10, p. 1; 11, pp. 1, 2]. LIWC considers the entire well field to be a single component of its blended system, which has 36 components (i.e., ground water wells or well fields) and serves a total population of 230,300 people [Ref. 11, p. 2; 12, p. 3]. Since no single system component contributes more than 40% of the LIWC water supply [Ref. 11, p. 2], the system population is apportioned equally among the 36 system components [Ref. 1, p. 51603], one of which is the Plant 5 Well Field. Therefore, the Plant 5 Well Field supplies water to approximately 6,397 people [Ref. 13, p. 1].

The people served by the LIWC Plant 5 Well Field are subject to contamination above health-based criteria prior to treatment [Ref. 13, p. 1]. Since April 1991, the Plant 5 well water has been treated by a packed tower aeration system (i.e., air strippers) with design capacity for 33 ppb of PCE [Ref. 10, pp. 1, 14; 14, p. 30]. PCE was detected in every quarterly raw water sample collected at the Plant 5 Well Field 1991 through 1993 and from 1999 through 2003, at concentrations ranging from 4.3 ug/L to 34 ug/L [Ref. 14, p. 30; 15, pp. 2 through 64; 45, pp. 7 through 29]. TCE and cis-1,2-DCE were also detected in some samples, at individual concentrations ranging from 0.5 ug/L to 3.1 ug/L [Ref. 15, pp. 2 through 64]. The contaminants detected at the LIWC Plant 5 Well Field are at the leading edge of the contaminated ground water plume [Ref. 4, p. 103]. USGS samples collected in 1992, from nearby observation wells screened at similar depths in the Jameco aquifer as the active Plant 5 wells, show non-detect background levels [Ref. 16, pp. 12, 34; 17, pp. 7, 9, 11, 15, 17, 19].

Stratum 1 (shallowest)

Stratum Name: Upper Glacial Aquifer

Description: The Pleistocene-age upper glacial (water-table) aquifer is the uppermost unit in Long Island's ground-water reservoir [Ref. 19, p. 4]. Glacial outwash deposits of fine to coarse sand and pebble- to boulder-sized gravel make up the upper glacial aquifer in the site vicinity [Ref. 19, p. 5; 20, p. 5]. The glacial outwash is moderately to highly permeable, with an average horizontal hydraulic conductivity of 270 feet per day (ft/d), or 9.5×10^{-2} centimeters per second (cm/s) [Ref. 19, p. 7; 20, p. 5]. Depth to water at the Peninsula Boulevard Ground Water Plume site ranges from about 2 to 9 feet below ground surface [Ref. 4, pp. 59, 60, 61]. Typical thickness of the upper glacial aquifer is 100 to 200 feet [Ref. 16, p. 5]. The upper glacial (water-table) aquifer is no longer used for public water supply in the site vicinity, but it is contaminated and interconnected to the Jameco aquifer [Ref. 10, p. 1; 11, p. 2].

Stratum 2**Stratum Name:** Gardiners Clay

Description: The Gardiners Clay consists of greenish-gray or brown clay and silt with interbedded layers of sand and gravel. The unit also contains some lignite and glauconite [Ref. 16, p. 5; 19, p. 5]. It is poorly permeable, but some localized sand layers can yield small quantities of water [Ref. 19, p. 5]. Where the Gardiners Clay is present and mostly clayey, its vertical hydraulic conductivity of 0.01 ft/d, or 3.39×10^{-6} cm/s, restricts vertical flow to the underlying Jameco and Magothy aquifers [Ref. 18, p. 1; 19, p. 5; 20, p. 5]. However, well logs and geologic literature show that the Gardiners Clay is not a continuous confining layer throughout the 2-mile radius of the Peninsula Boulevard Ground Water Plume site, including at the Plant 5 Well Field (i.e., at the northwestern edge of the site). The clay can be sandy, present only in lenses less than 3 feet thick, or absent [Ref. 11, p. 2; 13, pp. 1, 12, 44, 45, 64; 18, p. 3]. The Gardiners Clay is absent north and northeast of the site [Ref. 18, p. 3; 19, pp. 3, 4, 5].

Stratum 3**Stratum Name:** Jameco Aquifer

Description: The Jameco aquifer consists of the Jameco Gravel, a river-channel deposit of dark, coarse sand and gravel with cobbles and boulders. It is the oldest Pleistocene-age deposit on Long Island, and it has an extent similar but not equal to that of the Gardiners Clay [Ref. 16, p. 5; 18, pp. 1, 3]. The horizontal hydraulic conductivity of the Jameco aquifer exceeds 270 ft/d, or 9.5×10^{-2} cm/s, among the highest of any stratum in the study area [Ref. 16, p. 5; 20, p. 5]. The Jameco aquifer is of local importance in the site vicinity [Ref. 13, p. 1; 18, p. 3; 19, pp. 4, 5].

3.0.1.2 Aquifer Boundaries

Since aquifer interconnections can be established for multiple aquifers, as described below, they are combined into a single hydrologic unit for scoring purposes [Ref. 1, p. 51595]. Therefore, the aquifer of concern is referred to as the Upper Glacial/Jameco Aquifer.

3.0.1.2.1 Aquifer Interconnections

Aquifer interconnections occur at and within 2 miles of the site. The upper glacial (water-table) aquifer is no longer used for water supply in the site vicinity [Ref. 10, p. 1; 11, p. 2], but since it is contaminated and interconnected to the underlying Jameco aquifer, its data is included for HRS scoring purposes. Well logs and geologic literature show that the Gardiners Clay is not a continuous confining layer throughout the 2-mile radius of the site, including at the Plant 5 Well Field (i.e., at the site). The clay can be sandy, present only in lenses less than 3 feet thick, or absent [Ref. 11, p. 2; 13, pp. 1, 12, 44, 45, 64; 18, p. 3]. The Gardiners Clay is absent north and northeast of the site, where the upper glacial aquifer directly overlies the Jameco aquifer [Ref. 18, p. 3; 19, pp. 3, 4, 5]. The upper glacial and Jameco aquifers are both moderately to highly permeable with nearly identical hydraulic conductivities [Ref. 19, pp. 3, 4, 5]. Pumping from the Jameco aquifer at the Plant 5 Well Field exerts influence on shallow ground water flow in the upper glacial aquifer [Ref. 4, pp. 304, 306]. Based on these considerations, the upper glacial (water-table) and Jameco aquifers are hydraulically connected at the Plant 5 Well Field (i.e., at the site) [Ref. 13, p. 1]. The Upper Glacial and Jameco aquifers are combined into a single hydrologic unit for scoring purposes [Ref. 1, p. 51595], and the aquifer of concern is referred to as the Upper Glacial/Jameco Aquifer.

The Jameco aquifer is directly underlain by and hydraulically connected to the Upper Cretaceous-age Magothy aquifer, and the two aquifers are sometimes evaluated as a single hydrogeologic unit (i.e., the Jameco-Magothy aquifer) [Ref. 16, pp. 6, 7; 18, p. 1]. The Magothy aquifer is the primary source of public drinking water in Nassau County [Ref. 20, p. 61]. However, the Magothy aquifer is not considered in the evaluation of the Peninsula Boulevard Ground Water Plume site because inclusion of Magothy wells subject to potential contamination within the target distance limit (TDL) would not affect the listing decision.

3.1 LIKELIHOOD OF RELEASE

3.1.1 Observed Release

Aquifer Being Evaluated: Upper Glacial/Jameco Aquifer

Two sets of analytical data document observed releases attributable to the Peninsula Boulevard Ground Water Plume site: RI GeoProbe™ samples and LIWC Plant 5 Well Field raw water samples. The contaminants detected in the plume are PCE, TCE, and cis-1,2-DCE. The two sets of analytical data are evaluated independently for significance above background because they were collected from different strata and different depth ranges. The RI GeoProbe™ samples were collected from the upper glacial aquifer at depths ranging from 4 to 41 feet below ground surface [Ref. 4, pp. 66 through 72, 78 through 82], while the Plant 5 samples and associated background samples were collected from wells screened in the Jameco aquifer at depths ranging from 130 to 172 feet below ground surface [Ref. 11, pp. 1, 2; 17, pp. 6, 9, 11]. The contaminated samples are all considered to be part of the same plume because the upper glacial and Jameco aquifers are hydraulically connected at the Plant 5 Well Field (i.e., at the site) [Ref. 13, p. 1].

The RI GeoProbe™ ground water samples were collected on behalf of the NYSDEC Superfund Standby Program in accordance with standard field activity procedures, including equipment decontamination between samples [Ref. 4, pp. 9, 16 through 21, 165 through 174]. A NYSDOH-certified laboratory analyzed the samples for TCL VOCs, and an independent contractor performed data validation of the results [Ref. 4, pp. 18, 239 through 249]. The validator found the data for all samples collected during the RI to be fully usable for quantitative uses [Ref. 4, pp. 243, 247, 249]. PCE, TCE, and cis-1,2-DCE were detected at significant concentrations in several RI GeoProbe™ ground water samples, while other samples showed non-detect background concentrations for all three contaminants beyond the horizontal and vertical extent of the plume [Ref. 4, pp. 66 through 72, 103]. Numerous other VOCs were detected in RI ground water samples. MTBE, benzene, toluene, ethylbenzene, and xylenes are gasoline-related compounds that are not considered to be part of the site because of the petroleum exclusion. Numerous other compounds were detected only at estimated concentrations below SQLs or at insignificant concentrations below the maximum background SQLs; several chlorinated solvents that might be associated with the plume, including vinyl chloride and 1,1-dichloroethene, fit into that category [Ref. 4, pp. 66 through 72]. Those results are not presented here because they do not meet the criteria for observed release.

Analytical data obtained from the water company (i.e., LIWC) document PCE and TCE contamination at the Plant 5 Well Field for the periods from 1991 to 1993 and 1999 to 2003 [Ref. 15, all pages; 45, all pages]. The well field has been contaminated with PCE since 1991, when LIWC installed air strippers to treat the well water [Ref. 10, p. 1, 14; 14, p. 30]. Nearby USGS observation wells screened at similar depths in the Jameco aquifer show non-detect background concentrations for samples collected in October/November 1992. The background SQL for each compound (PCE and TCE) in the USGS samples was 3 ug/L [Ref. 17, pp. 6, 9, 11, 15, 17, 19].

The ground water data listed in the tables below for contaminated samples include VOC detections that meet the following observed release criteria:

- C Greater than or equal to the sample SQL [Ref. 30, pp. 7 through 14]; and
- C Greater than or equal to the appropriate maximum background SQL (10 ug/L for GeoProbe™ samples [Ref. 30, pp. 1 through 6] and 3 ug/L for Plant 5 samples [Ref. 17, pp. 6, 9, 11, 15, 17, 19], for all three contaminants), because the compounds were not detected above SQLs in any background samples; and
- C Not flagged with “J” as an estimated value.

The following qualifiers and abbreviations are used in the tables below [Ref. 21, pp. 135, 136; 22, pp. 149, 150; 23, pp. 119, 120; 24, pp. 105, 106; 25, pp. 90, 91; 26, pp. 99, 100; 27, pp. 106, 107]:

ug/L	Micrograms per liter
SQL	Sample Quantitation Limit
U	The compound was analyzed for but not detected at the reporting limit shown.
D	The reported value is from a dilution of the sample.

Chemical Analysis**Background Concentrations - RI GeoProbe™ locations (water-table aquifer)**

* Depth to the top of the sampling interval from ground surface [Ref. 4, pp. 66 through 72, 78 through 82].

Location	Sample ID	Depth (ft)*	Sampling Date	Hazardous Substance	Conc. (ug/L)	SQL (ug/L)	References
GP-1	GP-1W4-8	4	3/2/2000	cis-1,2-DCE PCE TCE	0.5 U 0.5 U 0.5 U	0.5 0.5 0.5	4, p. 66; 21, pp. 30, 141; 30, p. 1
GP-2	GP-2W40-44	40	3/2/2000	cis-1,2-DCE PCE TCE	0.5 U 0.5 U 0.5 U	0.5 0.5 0.5	4, p. 66; 21, pp. 38, 141; 30, pp. 1, 2
GP-6	GP-6W25-29	25	3/7/2000	cis-1,2-DCE PCE TCE	0.5 U 0.5 U 0.5 U	0.5 0.5 0.5	4, p. 67; 22, pp. 36, 157; 30, p. 2
GP-8	GP-8W32-36	32	3/9/2000	cis-1,2-DCE PCE TCE	0.5 U 0.5 U 0.5 U	0.5 0.5 0.5	4, p. 67; 22, pp. 50, 160; 30, p. 2
GP-9	GP9W42-46 (GP-9W42-46)	42	3/9/2000	cis-1,2-DCE PCE TCE	0.5 U 0.5 U 0.5 U	0.5 0.5 0.5	4, p. 68; 22, pp. 60, 162; 30, p. 3
GP-11	GP-11W4145 (GP-11W41-45)	41	3/13/2000	cis-1,2-DCE PCE TCE	0.5 U 0.5 U 0.5 U	0.5 0.5 0.5	4, p. 68; 23, pp. 29, 125; 30, p. 3
GP-37	GP-37 15' (GP-37-15)	11	10/17/2001	cis-1,2-DCE PCE TCE	10 U 10 U 10 U	10 10 10	4, p. 71; 26, pp. 19, 20, 103; 30, pp. 3, 4
GP-44	GP-44,25 (GP-44-25)	21	10/20/2001	cis-1,2-DCE PCE TCE	10 U 10 U 10 U	10 10 10	4, p. 71; 26, pp. 31, 32, 112; 30, p. 4
GP-45	GP-45,15 (GP-45-15)	11	10/20/2001	cis-1,2-DCE PCE TCE	10 U 10 U 10 U	10 10 10	4, p. 71; 26, pp. 33, 34, 112; 30, p. 4
GP-53	GP-53,15 (GP-53-15)	11	10/25/2001	cis-1,2-DCE PCE TCE	10 U 10 U 10 U	10 10 10	4, p. 72; 27, pp. 34, 35, 121; 30, pp. 4, 5
GP-55	GP-55,15 (GP-55-15)	11	10/26/2001	cis-1,2-DCE PCE TCE	10 U 10 U 10 U	10 10 10	4, p. 72; 27, pp. 38, 39, 121; 30, p. 5

Location	Sample ID	Depth (ft)*	Sampling Date	Hazardous Substance	Conc. (ug/L)	SQL (ug/L)	References
GP-56	GP-56,15 (GP-56-15)	11	10/26/2001	cis-1,2-DCE PCE TCE	10 U 10 U 10 U	10 10 10	4, p. 72; 27, pp. 40, 41, 121; 30, p. 5
GP-57	GP-57,15' (GP-57-15)	11	10/26/2001	cis-1,2-DCE PCE TCE	10 U 10 U 10 U	10 10 10	4, p. 72; 27, pp. 42, 43, 122; 30, p. 6
GP-58	GP-58,25' (GP-58-25)	21	10/26/2001	cis-1,2-DCE PCE TCE	10 U 10 U 10 U	10 10 10	4, p. 72; 27, pp. 44, 45, 122; 30, p. 6

Contaminated Samples - RI GeoProbe™ locations (water-table aquifer)

* Depth to the top of the sampling interval from ground surface [Ref. 4, pp. 66 through 72, 78 through 82].

Location	Sample ID	Depth (ft)*	Sampling Date	Hazardous Substance	Conc. (ug/L)	SQL (ug/L)	References
GP-2	GP-2W8-12 GP-2W16-20	8 16	3/2/2000 3/2/2000	PCE PCE	330 D 5,600 D	12.5 125	4, p. 66; 21, pp. 34, 36, 40, 42, 142; 30, p. 7
GP-4	GP-4W11-15	11	3/6/2000	PCE	16 D	1.2	4, p. 66; 21, pp. 50, 52, 148; 30, p. 7
GP-7	GP-7W13-17 GP-7W17-21 GP-7W21-24	13 17 21	3/8/2000 3/8/2000 3/8/2000	cis-1,2-DCE PCE TCE PCE cis-1,2-DCE PCE TCE	21 1,000 D 44 D 3,900 22 660 D 240 D	0.5 25 25 125 0.5 25 25	4, p. 67; 22, pp. 38, 40, 42, 44, 46, 160; 30, pp. 7, 8
GP-10	GP-10W1620 GP-10W2024	16 20	3/10/2000 3/10/2000	PCE PCE TCE	95 D 150 D 29 D	5 5 5	4, p. 68; 23, pp. 17, 19, 21, 23, 122; 30, pp. 8, 9
GP-13	GP-13W6-10 GP13W18-22 (GP-13W18-22)	6 18	3/14/2000 3/14/2000	PCE PCE TCE	19 D 3,200 D 140 D	2 83.4 83.4	4, p. 69; 23, pp. 35, 37, 39, 41, 127; 30, p. 9
GP-14	GP-14W4-8 GP-14W1620 (GP-14W16-20)	4 16	3/15/2000 3/15/2000	PCE TCE	36 D 19	1.6 0.5	4, p. 69; 23, pp. 43, 45, 47, 127; 30, pp. 9, 10
GP-16	GP16 6-10	6	3/12/2001	cis-1,2-DCE PCE	57 310 D	10 50	4, p. 69; 24, pp. 18, 20, 109; 30, p. 10
GP-17	GP17 16-20	16	3/13/2001	PCE	51	10	4, p. 69; 24, pp. 22, 110; 30, p. 10

Location	Sample ID	Depth (ft)*	Sampling Date	Hazardous Substance	Conc. (ug/L)	SQL (ug/L)	References
GP-18	GP18 21-25	21	3/13/2001	PCE	110	10	4, p. 69; 24, pp. 24, 110; 30, pp. 10, 11
GP-19	GP19 11-15	11	3/14/2001	PCE	120	10	4, p. 69; 24, pp. 26, 113; 30, p. 11
GP-20	GP20 16-20	16	3/14/2001	PCE	23	10	4, p. 69; 24, pp. 28, 113; 30, p. 11
GP-23	GP23 6-10	6	3/15/2001	PCE	160 D	20	4, p. 70; 24, pp. 34, 36, 113; 30, p. 11
GP-24	GP24 11-15	11	3/15/2001	PCE	550	100	4, p. 70; 24, pp. 38, 113; 30, p. 11
GP-25	GP25 16-20	16	3/15/2001	cis-1,2-DCE	47	10	4, p. 70; 24, pp. 40, 113; 30, p. 12
GP-29	GP29 11-15	11	3/16/2001	cis-1,2-DCE PCE TCE	12 2,400 D 140	10 250 10	4, p. 70; 25, pp. 16, 18, 94; 30, pp. 12, 13
GP-30	GP30 11-15	11	3/16/2001	cis-1,2-DCE PCE TCE	16 1,500 D 100	10 100 10	4, p. 70; 25, pp. 20, 22, 94; 30, p. 13
GP-34	GP34 16-20	16	3/19/2001	PCE	4,500 D	500	4, p. 70; 25, pp. 30, 32, 97; 30, p. 13
GP-38	GP-38 15' (GP-38-15)	11	10/17/2001	PCE	5,900	333	4, p. 71; 26, pp. 22, 103; 30, p. 13
GP-39	GP-39 15' (GP-39-15)	11	10/18/2001	PCE	5,400	1,000	4, p. 71; 26, pp. 24, 103; 30, p. 13
GP-40	GP-40 25' (GP-40-15)	21	10/18/2001	PCE	16	10	4, p. 71; 26, pp. 26, 103; 30, p. 14
GP-42	GP-42,15 (GP-42-15)	11	10/22/2001	cis-1,2-DCE PCE TCE	48 670 D 40	10 71 10	4, p. 71; 27, pp. 18, 19, 21, 115; 30, p. 14
GP-43	GP-43,25 (GP-43-25)	21	10/22/2001	cis-1,2-DCE PCE	28 25	10 10	4, p. 71; 27, pp. 22, 23, 115; 30, p. 14
GP-50	GP-50,15 (GP-50-15)	11	10/23/2001	PCE	620 D	62	4, p. 72; 27, pp. 31, 118; 30, p. 14

Background Concentrations - Jameco Aquifer wells

* Depth to the top of the screened interval from ground surface [Ref. 17, pp. 6, 7, 9, 11].

Location	Sample ID	Depth (ft)*	Sampling Date	Hazardous Substance	Conc. (ug/L)	Reporting Limit (ug/L)	References
N3932	403751073440202	172	10/7/1992	PCE TCE	# 3 # 3	3 3	17, pp. 1, 6, 7, 15
N4062	403621073441702	137	11/23/1992	PCE TCE	# 3 # 3	3 3	17, pp. 1, 9, 17
N4213	403911073432001	130	11/2/1992	PCE TCE	# 3 # 3	3 3	17, pp. 1, 11, 19

Contaminated Samples - Jameco Aquifer wells

* These samples were collected by LIWC using Standard Operating Procedures to meet the regulatory requirements of the Safe Drinking Water Act [Ref. 44, p. 1; 45, p. 2].

** Depth of wells currently supplying water to this component, according to LIWC [Ref. 17, pp. 6, 7, 9, 11].

Location	Sample ID*	Depth (ft)**	Sampling Date	Hazardous Substance	Conc. (ug/L)	Reporting Limit (ug/L)	References
LIWC Plant 5 Well Field	C910544/1	150	2/13/1991	PCE	34	0.5	45, p. 7
	C911538/1		4/30/1991	PCE	17	0.5	45, p. 9
	C912655/1		7/24/1991	PCE	13	0.5	45, p. 11
	C913619/1		10/2/1991	PCE	31	0.5	45, p. 13
	C920135/1		1/13/1992	PCE	20	0.5	45, p. 15
	C921320/2		4/10/1992	PCE	17	0.5	45, p. 17
	C922888/1		7/24/1992	PCE	15	0.5	45, p. 19
	C924182/1		10/21/1992	PCE	21	0.5	45, p. 21
	C930855		3/3/1993	PCE	16	0.5	45, p. 23
	C931355/1		4/2/1993	PCE	16	0.5	45, p. 25
	C932888/1		7/9/1993	PCE	16	0.5	45, p. 27
	C934628/1		10/19/1993	PCE	13	0.5	45, p. 29
	9902003		1/25/1999	PCE	5.5	0.5	15, p. 2
	992624.01		6/21/1999	PCE	8.6	0.5	15, p. 3
	CC34987		9/8/1999	PCE	8.7	0.5	15, p. 6
	CC43118		11/10/1999	PCE	14.4	0.5	15, p. 10
				TCE	3.1	0.5	
	CD10338		3/8/2000	PCE	11.3	0.5	15, p. 14
	CD24177		6/7/2000	PCE	4.3	0.5	15, p. 18
	CD36387		8/28/2000	PCE	13.4	0.5	15, p. 22
	CD42691		10/18/2000	PCE	10.0	0.5	15, p. 26
	CE09106		3/13/2001	PCE	7.5	0.5	15, p. 30
	CE24448		5/10/2001	PCE	5.2	0.5	15, p. 34
	CE53583		8/22/2001	PCE	12.3	0.5	15, p. 38
	0111346-004A		11/14/2001	PCE	11	0.5	15, p. 42
	0203688-002A		3/25/2002	PCE	7.8	0.5	15, p. 44
	0205430-002A		5/14/2002	PCE	8.5	0.5	15, p. 46
	0207401-004A		7/12/2002	PCE	5.2	0.5	15, p. 48
	0210617-001A		10/18/2002	PCE	7.7	0.5	15, p. 51
	CG17197		2/27/2003	PCE	7.4	0.5	15, p. 54
	CG15520		4/10/2003	PCE	10.3	0.5	15, p. 58
	0307841-001A		7/24/2003	PCE	4.4	0.5	15, p. 61
	CG47984		10/6/2003	PCE	7.2	0.5	15, p. 64

Attribution:

Because the source is a contaminated ground water plume with no positively identified source of contamination, attribution to any single facility has not been determined [Ref. 1, p. 51595; 4, p. 49]. The plume was discovered when NYSDEC conducted an RI of a dry-cleaning business on Peninsula Boulevard in Hewlett, New York [Ref. 3, p. 1; 4, pp. 48, 49, 103]. The investigation results indicated that PCE is present in shallow ground water; however, the highest concentrations and majority of plume area are not located directly beneath the subject dry-cleaning facility. Therefore, NYSDEC concluded that there is not enough evidence to identify the subject facility as the source of contamination [Ref. 4, pp. 11, 26, 31, 37, 38, 49, 103]. There are numerous other current and former dry-cleaning facilities in Hewlett [Ref. 4, pp. 116, 117; 7, pp. 1 through 10; 8, pp. 5, 8; 9, pp. 1 through 17, 49 through 56; 10, pp. 2 through 13]. The source is evaluated as a contaminated ground water plume with no identified source because there is not adequate information to attribute the contamination directly to any of the following possible waste sources.

Possible Sources: current and former dry cleaners located in Hewlett, NY**1. 1266 to 1274 Peninsula Boulevard**

This facility is located approximately 0.05 mile east of the Peninsula Boulevard Ground Water Plume [Ref. 4, pp. 96, 103]. One of the dry cleaners that was formerly located at this strip-mall address, Grove Cleaners & Tailors, was the facility that NYSDEC was investigating when the agency discovered the ground water plume to its west [Ref. 4, pp. 9, 10]. Grove Cleaners & Tailors occupied 1274 Peninsula Blvd. from approximately 1986 until 1993, when NYSDEC classified the facility as a Class 2 Inactive Hazardous Waste Disposal Site [Ref. 4, pp. 13, 52, 53]. Other dry cleaners formerly occupied stores in the same building. Chalet French Cleaners operated at 1270 Peninsula Blvd. in 1961, but was out of business by 1962. Norge Equipped Cleaners, Jiffy Clean and Steam, and Dutch Girl Continental Cleaners operated at 1266 Peninsula Blvd. from approximately 1969 until 1976 [Ref. 4, pp. 52, 53].

NYSDEC conducted its three-phase RI of Grove Cleaners from March 2000 until October 2001 [Ref. 4, pp. 8, 9]. The agency evaluated two dry wells on site as historical PCE source areas from which sludge had previously been removed [Ref. 4, p. 31]. Subsurface soil samples collected during the investigation did not show any exceedances of NYSDEC Recommended Soil Cleanup Objectives [Ref. 4, p. 34]. The RI results indicated that PCE is present in shallow ground water; however, the highest concentrations and majority of plume area are not located directly beneath the former Grove Cleaners facility. Therefore, NYSDEC concluded that there is not enough evidence to identify Grove Cleaners as the source of contamination [Ref. 4, pp. 11, 26, 31, 37, 38, 49, 103].

2. 401 Mill Road

This facility is located approximately 0.1 mile east of the Peninsula Boulevard Ground Water Plume [Ref. 4, pp. 96, 103]. NCDH reported that the former operator of Grove Cleaners began operating without a permit and using PCE at this location in July 1992 under the name Mill Road Drive-In Cleaners [Ref. 31, p. 2]. The facility failed an NCDH inspection in January 1993 due to not having the purchase and removal receipts on facility and not having posted a permit to operate. A March 1993 reinspection indicates that the violations had been corrected [Ref. 31, pp. 2, 3]. In November 1993, a customer observed a strong odor and experienced eye and sinus irritation while inside Mill Road Drive-In Cleaners. The customer subsequently experienced symptoms of exposure for about one week [Ref. 31, p. 4]. NCDH investigated the complaint in December 1993 and did not observe chemical odors in the establishment [Ref. 31, p. 5]. The facility passed NCDH inspections conducted from March 1997 through October 2000 [Ref. 31, pp. 6 through 10].

On November 14, 2000, the Nassau County Fire Marshal reported that a burner malfunction caused PCE to spill onto the floor of Mill Road Drive-In cleaners. A meter reading of greater than 7,000 parts per million (ppm) was recorded and odors were observed in a neighboring facility. NCDH investigated on November 30, 2000, and the operator claimed that there was no PCE spill on the date in question. NCDH did not observe strong odors in the dry cleaners or at the neighboring facility [Ref. 31, pp. 11 through 15]. The business changed owners in approximately September 2001, but the name did not change. Mill Road Cleaners failed an NCDH inspection in January 2002 because the facility was operating without a permit, which the operator subsequently filed in February 2002 [Ref. 31, pp. 16, 17].

EPA inspected Mill Road Drive-In Cleaners in July 2003, cited the owner for eight RCRA violations, and subsequently issued a Notice of Violation in January 2004 [Ref. 32, pp. 1 through 5]. A February 2004 on-line telephone directory lists Mill Road Drive-In Cleaners at this address [Ref. 43, pp. 1, 2]. There are no known sampling data for this facility [Ref. 31, all pages; 32, all pages].

3. 1244 West Broadway

This facility is located approximately 0.1 mile south of the southeastern edge of the Peninsula Boulevard Ground Water Plume [Ref. 4, pp. 96, 103]. The facility operates under the names Cedarwood Cleaners and Choe's W. Broadway Cleaners, Inc. [Ref. 33, p. 4; 43, p. 1]. Although the available documents do not indicate dates of operation, the documents do show that a 100-gallon PCE storage tank was installed inside the facility in December 1955 [Ref. 33, pp. 5, 7, 8, 11]. The facility also has an underground fuel oil tank that was installed in December 1955 [Ref. 33, pp. 5, 7].

NCDH conducted inspections of Cedarwood Cleaners beginning in May 1986. A Dry Cleaner Survey conducted by NCDH at that time indicates that Cedarwood Cleaners purchased 500 gallons of PCE annually, and that the PCE was stored in the tank on the premises [Ref. 33, p. 2]. NCDH issued Toxic or Hazardous Materials Storage Facility Permits to the facility in March 1988 and, after citing the new facility owner for noncompliance due to a delinquent Article XI Application, in April 1990 [Ref. 33, pp. 10 through 14].

During a December 2002 inspection, NYSDEC discovered a plywood- and metal-covered service trough surrounding the dry-cleaning machines at Cedarwood Cleaners [Ref. 34, pp. 1, 10]. EPA inspected the facility in July and December 2003, and observed that PCE-contaminated wastewater was being released to the trench to be evaporated. EPA cited the owner for twelve RCRA violations and subsequently issued a Notice of Violation [Ref. 35, pp. 1 through 6]. A February 2004 on-line telephone directory lists Cedarwood Dry Cleaners and Choe's West Broadway Cleaners at this address [Ref. 43, p. 1]. There are no known sampling data for this facility [Ref. 33, all pages; 34, all pages; 35, all pages].

4. 1245 Broadway

This facility is located approximately 0.25 mile southeast of the Peninsula Boulevard Ground Water Plume [Ref. 4, pp. 96, 103]. The facility operated as Harbor French Dry Cleaners through June 1995, when the business moved the dry-cleaning equipment to its new facility at 401 Mill Road (Address 2 above) [Ref. 36, pp. 2 through 25]. Vogue Cleaning Corp (a.k.a. Vogue French Cleaners) subsequently installed new equipment and has operated the dry-cleaning facility since at least April 1996 [Ref. 36, pp. 23, 24, 26 through 36; 43, p. 2]. A February 2004 on-line telephone directory lists Vogue French Cleaners at this address [Ref. 43, p. 2].

NCDH conducted inspections of the facility beginning in August 1988. An Article XI Application filed in September 1988 indicated storage of PCE and other miscellaneous spotting chemicals [Ref. 36, pp. 3 through 6]. NCDH issued a Toxic or Hazardous Materials Storage Facility Permit to Harbor French Dry Cleaners in October 1988 [Ref. 36, p. 7]. NCDH cited the facility for noncompliance in September 1991 due to the facility not having completed a 1990 Annual Chemical Report [Ref. 36, p. 13], and again in February 1993 for not having purchase and removal receipts available [Ref. 36, p. 18]. The facility failed another NCDH inspection in October 1994 due to a problem with the machinery venting odors into the room [Ref. 36, p. 21]. Vogue Cleaning Corp. indicated the use of PCE and other spotting chemicals in an Article XI Application dated April 1996 [Ref. 36, p. 26, 27, 28]. There are no known sampling data for this facility [Ref. 36, all pages].

5. 1345 Peninsula Boulevard

This facility is located approximately 0.25 mile east of the Peninsula Boulevard Ground Water Plume [Ref. 4, pp. 96, 103]. The facility has operated as American Drive-In Cleaners of Hewlett since 1958 [Ref. 37, pp. 4, 7, 56]. A February 2004 on-line telephone directory lists American Drive-In Cleaners of Hewlett at this address [Ref. 43, pp. 1, 2].

On June 3 and 23, 1983 NCDH inspected American Drive-In Cleaners and found pipes leading from the facility boiler room, along the ground, through a chain-link fence, and discharging to railroad tracks. Further inspection by NCDH in September 1983 revealed that the original discharge pipes were still in operation and a dispersion well inside the building was being used. A NCDH inspection in October 1983 revealed that three infusion wells had been installed and were receiving all cooling water. NCDH observed that the water discharge to the ground surface had stopped [Ref. 37, pp. 2 through 12]. Dry Cleaning Inspection Reports from May 1986 and December 1987 indicate that 1,000 gallons of PCE were being used each year [Ref. 37, pp. 13 through 15]. American Drive-In Cleaners filed an Article XI Application and NCDH issued a Toxic or Hazardous Materials Storage Facility Permit in October 1989 and modified it in April 1990 [Ref. 37, pp. 16 through 20]. NCDH cited the facility for noncompliance in June 1991 due to a delinquent 1990 Annual Report [Ref. 37, p. 21]. In March 1993, NCDH discovered that two cesspools were still receiving dry-cleaning wastewater and cited the property for violating Article II, Section 5(d) of the Nassau County Public Health Ordinance, which requires the pumping and backfilling of all cesspools as part of a sewer connection [Ref. 37, p. 25].

NCDH conducted two sampling events at American Drive-In Cleaners in January and March 2002. NCDH sampled wastewater discharging from the facility to the ground surface on both occasions. The results indicated the presence of PCE, cis-1,2-DCE, and TCE at concentrations ranging from 0.7 ug/L to 16 ug/L [Ref. 37, pp. 35 through 42]. Surface soil samples collected from beneath and downstream of the wastewater discharges in March 2002 indicated the presence of PCE at concentrations ranging from 390 to 4,000 nanograms per gram (ng/g). Cis-1,2-DCE was also detected at 7,400 ng/g in the sample from beneath the discharge [Ref. 37, pp. 40, 41, 44, 46, 54].

6. 1344 Broadway

This facility is located approximately 0.3 mile east of the Peninsula Boulevard Ground Water Plume [Ref. 4, pp. 96, 103]. The facility operated as Everit Cleaners until sometime before July 1990. NCDH cited the facility for noncompliance in January 1990 due to no records of waste disposal and a delinquent Article XI Application. The subsequent application indicated the use of PCE and miscellaneous spotting chemicals. In July 1990, NCDH reported that the facility had closed and Everit Cleaners was out of business [Ref. 38, pp. 2 through 10]. A February 2004 on-line telephone directory lists numerous businesses, but no dry cleaners, currently at this strip-mall address [Ref. 38, p. 7; 43, pp. 1, 2, 7, 8, 9]. There are no known sampling data for this facility [Ref. 38, all pages].

7. 1338 Peninsula Boulevard

This facility is located approximately 0.3 mile northeast of the Peninsula Boulevard Ground Water Plume [Ref. 4, pp. 96, 103]. The facility operated as Velvet Touch Dry Cleaners until sometime between November 1995 and March 1996 [Ref. 39, pp. 2, 21, 22]. By November 1996, the facility was operating as a karate school [Ref. 39, p. 22]. A February 2004 on-line telephone directory confirms that a dry cleaner no longer operates at this address [Ref. 43, pp. 1, 2, 11].

NCDH conducted inspections of the facility beginning in May 1986, when a Dry Cleaner Survey indicated that the facility purchased 600 gallons of PCE annually [Ref. 39, pp. 2, 3, 4]. An Article XI Application was filed in May 1988. NCDH issued a Toxic or Hazardous Materials Storage Facility Permit in June 1988 and modified it in March 1989 [Ref. 39, p. 5 through 9]. NCDH cited the facility for noncompliance in December 1991 due to the facility having a delinquent 1990 Annual Report [Ref. 39, p. 11]. In May 1995, NCDH received a letter from an attorney stating that Velvet Touch cleaners had filed for bankruptcy and that the assets were auctioned off to a bidder who planned to operate the facility as a dry cleaners [Ref. 39, p. 19]. There are no known sampling data for this facility [Ref. 39, all pages].

8. 1309 Broadway

This facility is located approximately 0.5 mile southeast of the Peninsula Boulevard Ground Water Plume [Ref. 4, pp. 96, 103]. The facility has operated as Piermont Cleaners at least since May 1986, when NCDH began its inspections of the facility, except for a brief period in 1989-1990 when the facility operated as Frandally Cleaners Inc. [Ref. 40, pp. 2 through 48]. A February 2004 on-line telephone directory lists Piermont Cleaners at this address [Ref. 43, p. 2].

NCDH conducted inspections of the facility throughout its history. In 1989 Piermont Cleaners was inspected and it was discovered that the facility purchased approximately 300 gallons of PCE annually [Ref. 40, p. 3]. Article XI Applications dated July 1989, March 1990, October 1992, and October 1996 all indicate storage of PCE and spotting chemicals on the premises [Ref. 40, p. 7, 12, 23, 37]. NCDH issued Piermont Cleaners an Article XI Toxic or Hazardous Materials Storage Facility Permit in April 1990 [Ref. 40, p. 15]. A Dry Cleaner Inspection Report from March 1993 indicates that the facility has floor drains located in the basement [Ref. 40, p. 26]. In October 1993, a neighboring business complained of odors from Piermont Cleaners penetrating the business [Ref. 40, p. 27]. NCDH investigated and found a PCE odor in the clothes dryer and suggested that Piermont replace sheet rock in the ceiling separating the two businesses [Ref. 40, pp. 28, 29].

A complaint was levied against Piermont Cleaners in November 1997 by a neighboring facility. Indoor air samples collected from the neighboring facility indicated an impact from Piermont Cleaners' dry-cleaning operation [Ref. 40, p. 38]. According to notes from NCDH, Piermont Cleaners has a sump pump in a floor drain connected to the sanitary sewer. During a dye test performed by NCDH in December 2001, the dye introduced into the interior floor drain at Piermont Cleaners was observed in a sewer manhole on Piermont Street within minutes [Ref. 40, pp. 43 through 47]. There are no other known sampling data for this facility [Ref. 40, all pages].

9. 1435 Broadway

This facility is located approximately 0.5 mile east of the Peninsula Boulevard Ground Water Plume [Ref. 4, pp. 96, 103]. The facility operated as Country Cleaners & Launderers, Inc. in the 1980s [Ref. 41, pp. 2, 3, 4]. In January 1990, NCDH observed that Country Cleaners was out of business but some clothing was still noted in the store [Ref. 41, p. 5]. Eric's Custom Dry Cleaners operated at this location for a brief period in 1990 and 1991 [Ref. 41, pp. 6 through 12]. Deluxe Dry Cleaners subsequently operated at the facility from 1991 until late 1994, when NCDH reported that the dry cleaner was out of business and all equipment had been removed from the building [Ref. 41, pp. 13 through 16, 26 through 35]. In July 1995, NCDH reported that a cellular phone shop was operating at the location [Ref. 41, pp. 2, 5, 6, 13, 35, 36]. A February 2004 on-line telephone directory lists Five Towns Deli at this address and confirms that a dry cleaner no longer operates at this location [Ref. 43, pp. 1, 2, 13].

In May 1986, NCDH inspected Country Cleaners and reported that the facility purchased 200 gallons of PCE annually and stored it in a 100-gallon tank [Ref. 41, pp. 2, 3, 4]. During its brief period of operation, Eric's Custom Dry Cleaners reported purchasing 250 gallons of PCE annually [Ref. 41, p. 8]. Eric's Custom Dry Cleaners filled out an Article XI application stating that PCE, spotting chemicals, and filter cartridges were stored at the facility [Ref. 41, pp. 9, 10, 11]. In February 1992, NCDH observed the following violations at Deluxe Dry Cleaners: a floor drain/dry well combination was located in the basement floor; sediment in the dry well emitted vapors registering more than 400 units on an organic vapor meter; the operator was storing 32 filter cartridges in cardboard boxes in the basement; and the operator was storing PCE in a 55-gallon drum, which was too large for the facility's exempt status [Ref. 41, p. 24]. NCDH issued a Notice of Violation to Deluxe Dry Cleaners facility in June 1994 for operating without an Article XI permit and for storing hazardous materials in excess of 50 gallons [Ref. 41, pp. 29, 30].

Samples were collected on February 13, 1992 from the basement floor drain and analyzed for VOCs. Results indicated the presence of PCE, TCE, and cis-1,2-DCE at respective concentrations of 31,000 micrograms per gram (ug/g), 17 ug/g; and 11 ug/g [Ref. 41, pp. 21, 22, 23]. Samples were also collected on July 18, 1995 from the large and small floor drains with injection wells and analyzed for VOCs and Organic Extraction. Results indicated diethyl phthalate at 49 ug/L, di-n-butyl phthalate at 9 ug/L, and butyl benzyl phthalate at 10 ug/L. Sample results also indicated that the sample contained a high molecular weight oil similar to motor oil, with an approximate concentration of 2,200 parts per billion (ppb) [Ref. 41, pp. 37 through 47].

10. 1510 Broadway

This facility is located approximately 0.5 mile east of the Peninsula Boulevard Ground Water Plume [Ref. 4, pp. 96, 103]. The facility operated as Con Mag Cleaners until November 1991, and subsequently as Ambrook Cleaners until sometime between May 1995 and April 1997 [Ref. 42, pp. 15, 16, 23]. In April 1997, NCDH reported that Ambrook Cleaners was out of business and the store was vacant [Ref. 42, p. 23]. A February 2004 on-line telephone directory lists a tanning salon at this address and confirms that a dry cleaner no longer operates at this address [Ref. 43, pp. 1, 2, 15].

NCDH conducted inspections of the facility beginning in May 1986. A Dry Cleaner Survey dated May 1986 indicated that Con Mag Cleaners used PCE and purchased 600 gallons per year [Ref. 42, p. 3]. Con Mag Cleaners listed PCE and miscellaneous spotting chemicals on its Article XI Application filed in February 1988 [Ref. 42, pp. 5 through 9]. NCDH issued a Toxic or Hazardous Materials Storage Facility Permit to Con Mag Cleaners in April 1988 [Ref. 42, p. 10]. NCDH cited the facility for noncompliance in October 1991 due to a delinquent 1990 chemical report [Ref. 42, p. 14]. Ambrook Cleaners acquired Con Mag Cleaners in November 1991, and filed an Article XI Application in May 1992 indicating PCE and miscellaneous spotting chemicals [Ref. 42, pp. 15 through 18]. There are no known sampling data for this facility [Ref. 42, all pages].

11. 1765 Peninsula Boulevard

A February 2004 on-line telephone directory lists Empire French Dry Cleaners at this address, which is located approximately 1.2 mile north-northeast of the Peninsula Boulevard Ground Water Plume [Ref. 43, pp. 1, 17]. NCDH had no records of dry-cleaning operations at this facility [Ref. 31 through 42, all pages].

Hazardous Substances Released:

cis-1,2-Dichloroethylene (cis-1,2-DCE)
Tetrachloroethylene (PCE)
Trichloroethylene (TCE)

3.2 WASTE CHARACTERISTICS

3.2.1 Toxicity/Mobility

<u>Hazardous Substance</u>	<u>Source Numbers</u>	<u>Toxicity Factor Value</u>	<u>Mobility Factor Value*</u>	<u>Toxicity/ Mobility</u>	<u>Reference(s)</u>
cis 1,2-DCE	1, OR	100	1.0	100	2, p. BI-5
PCE	1, OR	100	1.0	100	2, p. BI-10
TCE	1, OR	10	1.0	10	2, p. BI-11

* Each hazardous substance that meets the criteria for an observed release by chemical analysis (cis-1,2-DCE; PCE; and TCE) is assigned a ground water mobility factor value of 1 [Ref. 1, p. 51601].

cis-1,2-DCE = cis-1,2-Dichloroethylene

PCE = Tetrachloroethylene

TCE = Trichloroethylene

OR = Observed Release

Toxicity/Mobility Factor Value: 100

3.2.2 Hazardous Waste Quantity

<u>Source Number</u>	<u>Source Hazardous Waste Quantity (HWQ) Value (Section 2.4.2.1.5)</u>	<u>Is source hazardous constituent quantity data complete? (yes/no)</u>
1	>0	No

Sum of Values:	>0, but unknown	

Based on the fact that targets are subject to Level I concentrations (see Section 3.3.2.3 of this document), a hazardous waste quantity factor value of 100 is assigned for the ground water pathway [Ref. 1, p. 51592].

3.2.3 Waste Characteristics Factor Category Value

PCE and cis-1,2-DCE correspond to the toxicity/mobility factor value of 100, as shown previously (see Section 3.2.1).

Toxicity/Mobility Factor Value (100) x Hazardous
Waste Quantity Factor Value (100): 1×10^4

The product 1×10^4 corresponds to a Waste Characteristics Factor Category Value of 10 in Table 2-7 of the HRS [Ref. 1, p. 51592].

Hazardous Waste Quantity Factor Value: 100
Waste Characteristics Factor Category Value: 10

3.3 TARGETS

The LIWC Plant 5 Well Field is located at the northwestern edge of the ground water plume and is subject to Level I concentrations prior to treatment. The NYSDEC RI indicated that ground water flows from the main plume area to the northwest, in the direction of the LIWC Plant 5 Well Field [Ref. 4, pp. 22, 28, 47, 93, 100]. This cluster of 43 active wells (and numerous inactive wells) is located just northwest of the plume delineated by the RI [Ref. 4, pp. 93, 103; 10, p. 1; 11, p. 2]. The active wells are all screened in the Jameco aquifer at depths of approximately 150 feet, and contribute to the LIWC system through a common suction unit that prevents access to individual wells [Ref. 10, p. 1; 11, pp. 1, 2]. LIWC considers the entire well field to be a single component of its blended system, which has 36 components (i.e., ground water wells) and serves a total population of 230,300 people [Ref. 11, p. 2; 12, p. 3]. No single system component provides more than 40% of the LIWC water supply, so the Plant 5 Well Field supplies water to approximately 6,397 people [Ref. 11, p. 2; 13, p. 1].

The people served by the LIWC Plant 5 Well Field are subject to contamination above health-based criteria prior to treatment, and the contaminants are attributable to the Peninsula Boulevard Ground Water Plume site [Ref. 13, p. 1]. Since April 1991, the Plant 5 well water has been treated by a packed tower aeration system (i.e., air strippers) with design capacity for 33 ppb of PCE [Ref. 10, pp. 1, 14; 14, p. 30]. PCE was detected in every quarterly raw water sample collected at the Plant 5 Well Field from 1999 through 2003, at concentrations ranging from 4.3 ug/L to 14.4 ug/L [Ref. 14, p. 30; 15, pp. 2 through 64]. Trichloroethylene (TCE) was detected in 14 of 20 samples and cis-1,2-dichloroethylene (cis-1,2-DCE) was detected in four samples, at individual concentrations ranging from 0.5 ug/L to 3.1 ug/L [Ref. 15, pp. 2 through 64]. The contaminants detected at the LIWC Plant 5 Well Field delineate the leading edge of the contaminated ground water plume [Ref. 4, p. 103]. Non-detect background levels, for nearby observation wells screened at similar depths in the Jameco aquifer as the active Plant 5 wells, are shown by USGS samples collected in 1992 [Ref. 16, pp. 12, 34; 17, pp. 7, 9, 11, 15, 17, 19]. No other target wells are known to contain contamination attributable to the site, making the Upper Glacial/Jameco the aquifer of concern [Ref. 13, p. 1].

Only the Plant 5 Well Field, subject to Level I actual contamination, is listed. There are also numerous other water systems and wells within 4 miles of the site, however, those wells are not included in scoring the site because the Ground Water Migration Pathway score achieves its maximum without them.

<u>Well</u>	<u>Distance From Source</u>	<u>Aquifer</u>	<u>Level I Contam. (Y/N)*</u>	<u>Level II Contam. (Y/N)</u>	<u>Potential Contam. (Y/N)</u>	<u>Benchmark for PCE (ug/L)**</u>	<u>Reference for Benchmarks</u>
Plant 5	0 mile	Jameco	Y	N	N	1.6	2, pp. BII-11

* The tables in Section 3.1.1 show the Level I PCE concentrations and significance above background.

** The lowest benchmark for PCE is the Cancer Risk Screening Concentration, which is 1.6×10^{-3} milligrams per liter (mg/L), or 1.6 ug/L [Ref. 2, p. BII-11].

3.3.1 Nearest Well

There is an observed release by chemical analysis for a drinking water well within the target distance limit subject to Level I contamination. Therefore, a nearest well factor value of 50 is assigned [Ref. 1, pp. 51602, 51603].

Nearest Well Factor Value: 50

3.3.2 Population**3.3.2.2 Level I Concentrations**

<u>Level I Well</u>	<u>Population</u>	<u>Reference(s)</u>
Plant 5 Well Field	6,397	Ref. 13, p. 1

Population Served by Level I Wells: 6,397

Level I Concentrations Factor Value: 63,970

3.3.2.3 Level II Concentrations

Level II concentrations are not documented.

<u>Level II Well</u>	<u>Population</u>	<u>Reference(s)</u>
N/A		

Population Served by Level II Wells: 0

Level II Concentrations Factor Value: 0

3.3.2.4 Potential Contamination

The Potential Contamination Factor is not scored. The exclusion of this scoring factor does not affect the listing decision for the site.

The populations currently served by wells located within 4 miles of the site that draw from the aquifer of concern are:

<u>Distance Category</u>	<u>Potential Population</u>	<u>Distance-Weighted Population Value</u>
0 to ¼ mile	NS	NS
>¼ to ½ mile	NS	NS
>½ to 1 mile	NS	NS
>1 to 2 mile	NS	NS
>2 to 3 mile	NS	NS
>3 to 4 mile	NS	NS

Sum of Distance-Weighted Population Values: NS

Potential Contamination Factor Value: NS

3.3.3 Resources

It is unknown whether ground water is used as a resource within the 4-mile radius of the site. Therefore, a resources factor value of 0 is assigned [Ref. 1, p. 51604].

Resources Factor Value: 0

3.3.4 Wellhead Protection Area

The Wellhead Protection Program for New York was developed in accordance with Section 1428 of the Safe Drinking Water Act and approved by EPA between 1990 and 1991 [Ref. 28, p. 1; Ref. 29, p. 1]. For public water supplies using the Glacial aquifer on Long Island, wellhead protection areas are defined by fixed radii of 1,500 feet upgradient and 500 feet downgradient of the well, respectively [Ref. 29, pp. 19 through 24]. As shown in Section 3.1.1, the upper glacial (water-table) and Jameco aquifers are hydraulically connected at the Plant 5 Well Field (i.e., at the site) [Ref. 13, p. 1]. The Gardiners Clay is absent north and northeast of the site, where the upper glacial aquifer directly overlies the Jameco aquifer [Ref. 18, p. 3; 19, pp. 3, 4, 5]. The upper glacial and Jameco aquifers are both moderately to highly permeable with nearly identical hydraulic conductivities [Ref. 19, pp. 3, 4, 5]. Pumping from the Jameco aquifer at the Plant 5 Well Field exerts influence on shallow ground water flow in the upper glacial aquifer [Ref. 4, pp. 304, 306]. The upper glacial and Jameco aquifers are combined into a single hydrologic unit for scoring purposes [Ref. 1, p. 51595], and the aquifer of concern is referred to as the Upper Glacial/Jameco Aquifer. Due to this hydraulic connection between the upper glacial (water-table) and Jameco aquifers at the site, the Plant 5 Well Field (i.e., a public water supply) draws water from the Glacial aquifer as well as from the Jameco aquifer [Ref. 13, p. 1; 19, pp. 3, 4, 5]. Based on this information, observed ground water contamination associated with the site lies within a designated wellhead protection area (i.e., at the Plant 5 Well Field), and a wellhead protection area factor value of 20 is assigned [Ref. 1, p. 51604].

Wellhead Protection Area Factor Value: 20